

AMENDMENT AND RESPONSE TO FINAL OFFICE ACTION  
U.S. Serial No. 10/607,010

**AMENDMENTS TO THE SPECIFICATION**

Please amend the existing paragraph that begins on page 4, line 12, as follows:

--According to another embodiment of this invention, a lockable joint coupling a second member and a pin clamp includes a shaft extending transversely from the second end of the second member, the shaft including at least one radial circumferential groove, a hole within a first jaw of the pin clamp that receives the shaft, a locator pin of the pin clamp that is received within the at least one radial circumferential groove to releasably couple the second member and the pin clamp, and a first bolt that passes through openings in the first jaw and a second jaw of the pin clamp such that tightening of the first bolt interferes with the shaft and locks rotation of the pin clamp and the second member.--

Please amend the existing paragraph that begins on page 6, line 15, as follows:

--According to certain exemplary embodiments of this invention, an external fixation apparatus includes a first member attachable to a first bone segment through pins, a second member coupled to the first member through a lockable joint, the second member including a shaft extending transversely from a distal end of the second member with at least one radial circumferential groove in the shaft, and a pin clamp attachable to a second bone segment and releasably coupled to and rotatable about the second member. The pin clamp may include a first jaw and a second jaw, the first jaw including a hole that receives the shaft, a locator pin that is received within the at least one radial circumferential groove of the shaft to releasably couple the second member and the pin clamp, and a first bolt that passes through openings in the first and second jaws such that tightening of the first bolt interferes with the shaft and

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locks rotation of the pin clamp and the second member. The locator pin may be configured to allow for pull release or pushbutton release of the second member from the pin clamp. The pin clamp may include second and third bolts that hold the first and second jaws together and attach and clamp pins or wires to the second bone segment, and the first and second jaws may include openings that receive biasing elements and threaded ends of the second and third bolts.--

Please amend the existing paragraph that begins on page 7, line 8, as follows:

--According to certain exemplary embodiments of this invention, an external fixation system for attaching pins or wires to at least one bone segment includes an external fixation device and a pin clamp. The pin clamp may include a first jaw and a second jaw, biasing elements received within openings in the first and second jaws, first and second bolts that extend through the openings in the first and second jaws, compressing the biasing elements and holding the first and second jaws together, a hole in the first jaw that receives a shaft of an external fixation device, the shaft having at least one radial circumferential groove, a locator pin that is received within the at least one radial circumferential groove of the shaft to releasably couple the external fixation device and the pin clamp, and a third bolt that passes through openings in the first and second jaws such that sufficient tightening of the third bolt interferes with the shaft and locks rotation of the pin clamp and the external fixation device. In one embodiment, the external fixation device is a handle such that the pin clamp and handle coupled thereto may be used as a drill guide. In another embodiment, the external fixation device is a fixation component that includes a capture member that receives a pin,

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bar, or wire. In another embodiment, the external fixation device is a second member with first and second ends that may be translated transversely in at least two dimensions relative to a longitudinal axis of the second member.--

Please amend the existing paragraph that begins on page 21, line 3, as follows:

--At end 318 is a single prong that comprises a unitary stem. A shaft 320 extends from end 318, as shown in Figure 17, transverse to the longitudinal axis of second member 310. Shaft 320 includes at least one radial circumferential groove 322. Shaft 320 may include an alignment hole 314 through which a pin or wire may be placed into the bone. Such alignment may be useful to approximate a desired center of rotation of pin clamp 340. For example, a wire may be placed through alignment hole 314 and into the talus to approximate the pivot axis of a patient's ankle.--

Please amend the existing paragraph that begins on page 22, line 4, as follows:

--First jaw 346 includes a stepped hole 362 that retains a biasing element, such as a spring 364, and locator pin 360. When shaft 320 of second member 310 is fully inserted within hole 350 of pin clamp 340, radial circumferential groove 322 receives locator pin 360, engaging second member 310 and first jaw 346 of pin clamp 340 while still allowing rotation of pin clamp 340 about shaft 320. To release engagement between second member 310 and pin clamp 340, locator pin 360 is pulled and shaft 320 of second member 310 may easily be removed from hole 350 of first jaw 346.--

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Please amend the existing paragraph that begins on page 22, line 11, as follows:

--Figure 19 shows another exemplary embodiment of a pin clamp with a locator pin according to this invention. Pin clamp 340B is the same as pin clamp 340 shown in Figures 15-18 except that the location and configuration of the locator pin assembly has changed. As shown in Figure 19, locator pin 360B is a pushbutton release mechanism rather than a pull release mechanism. Locator pin 360B and spring 364 are received within a stepped hole 366 in first jaw 346. The proximal tip of locator pin 360B is “pinned” to a button 368 in first jaw 346 in such a way that if you push button 368, locator pin 360B is translated up and out of a mating groove in a hinge shaft (not shown, but an example is shaft 320 with radial circumferential groove 322 shown in Figures 16 and 17) allowing removal of pin clamp 340 from a device with which it was engaged. Spring 364 biases locator pin 360B toward the center of hole 366. As pin clamp 340 is being engaged with shaft 320 with radial circumferential groove 322, locator pin 360B is forced up, compressing spring 364. The tip of locator pin 360B slides along shaft 320 and then snaps into groove 322 on shaft 320, engaging shaft 320 and pin clamp 340. Pushing button 368 allows for shaft 320 and pin clamp 340 to separated from one another.--

Please amend the existing paragraph that begins on page 23, line 3, as follows:

--The embodiments shown and described in Figures 15-19 provide for quick and easy reconfiguration of a pin clamp for use with either left or right limb applications, eliminating the need for pin clamps specific to each limb. Additionally, these embodiments allow for quick attachment and removal of second members or stems and pin clamps of external

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fixation systems. Furthermore, a modular design is provided whereby a pin clamp or second member according to these embodiments may be provided separately from each other and each may be connected with other components, elements, or devices of a fixation system that are similarly designed. For example, the handle assembly shown in Figure 20 may engage a pin clamp, such as pin clamp 340 or 340B, to form a drill guide for use by a surgeon. A shaft 384 with a radial circumferential groove 386 extends from one end of a handle 382, as shown in Figure 20. Shaft 384 may be inserted into a hole of a pin clamp and the locator pin of the pin clamp is received within radial circumferential groove 386 to engage the handle assembly and the pin clamp. Shaft 384 may also include a key 388 that may engage an opening with a corresponding shape in a pin clamp to assist in aligning the pin clamp with the long axis of handle 382. The engaged handle assembly and pin clamp act as a drill guide, with openings in the pin clamp being able to receive a drill, drill bit, depth gauge, or tissue sleeve used to assist a surgeon in placing a pin, wire, or similar fixation element into a patient's bone.--

Please amend the existing paragraph that begins on page 23, line 20, as follows:

--In another example, Figure 21 shows a capture member 390 for receiving a bar 392 of an external fixation system coupled to a shaft 394 with a radial circumferential groove 396, shaft 394 being designed for engagement with an embodiment of a pin clamp, such as pin clamp 340 or 340B, according to this invention. Capture members, such as capture member 390, for use in external fixation systems are described in detail in U.S. Application No. 10/067,052, filed February 4, 2002, entitled "External Fixation System," and

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International Application No. PCT/US03/02712, filed January 30, 2003, entitled "External Fixation System," the entire contents of each of which are hereby incorporated by reference. For example, as shown in Figure 21, an end 398 of shaft 394 may include a generally spherical planetary member having inner and outer surfaces and an aperture adapted to receive a connector, while capture member 390 includes a cooperating surface adapted to receive and correspond generally in shape with the outer surface of the planetary member and an aperture adapted to receive a connector. It should be understood that end 398 of shaft 394 may be formed to mate with capture member 390 according to any of the principles disclosed in the above-referenced, incorporated-by-reference patent applications.--